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Full title: Delirium in acute stroke: A survey of screening and diagnostic practice in Scotland

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Abstract

Aims to survey the use of delirium screening and diagnostic tools in patients with acute stroke across Scotland, and to establish whether doctors and nurses felt the tools used were suitable for stroke patients.

Methods An invitation to participate in a web-based survey was e-mailed to 217 doctors and nurses working in acute stroke across Scotland. Descriptive statistics were used to report nominal data and content analysis was used to interpret free text responses.

Results Sixty five responses were logged (30% return rate). 48% of respondents reported they routinely screened newly admitted patients for delirium. Following initial screening, 38% reported they screened for delirium as the need arises. 43% reported using clinical judgment to diagnose delirium and 32% stated they combined clinical judgment with a standardised tool. 28% of clinicians reported they used The Confusion Assessment Method however, only 13.5% felt it was suitable for stroke patients.

Conclusions Screening for delirium is inconsistent in Scottish stroke services and there is uncertainty regarding the suitability of screening tools with stroke patients. As the importance of early identification of delirium on stroke outcomes is articulated in recent publications, validating a screening tool to detect delirium in acute stroke is recommended.

Introduction

Delirium is a common neuropsychiatric condition affecting 20-30% of elderly patients across most hospital settings [1]. In acute stroke, the incidence of delirium reported by individual studies ranges from 10% [2] to 48% [3], and meta analyses performed recently placed the incidence around 26%-28% [4, 5]. Delirium is associated with increased mortality, morbidity and length of hospital stay [5-8] and it has been strongly associated with development of cognitive impairment in the long term in the general medical setting [9, 10]. In acute stroke, recent studies have clearly demonstrated that patients who develop delirium are more likely to die within 12 months, have poorer functional outcomes and are at higher risk of developing dementia [4, 5, 11, 12]. There are calls in the literature for clinicians to place an emphasis on early identification of delirium in stroke patients, using a tool validated specifically for this population, as early intervention may minimise the aforementioned unfavourable outcomes [5, 13, 14].

The most recent guidance published in the United Kingdom (UK) both by National Institute for Health and Clinical Excellence (NICE) and by the Royal College of Physicians (RCP) do not mention delirium as a specific complication of stroke [15, 16], however, both refer to cognitive impairment and inattention. The word "confusion" is mentioned in the Scottish Intercollegiate Guidelines Network document "Management of Patients with Stroke" (SIGN 118) but there is no specific guidance about how to screen for or manage this "confusion" [17]. Clinical guidelines from other English speaking countries were examined for comparison: Australian guidelines [18] do not mention delirium in stroke patients; American Heart Association (AHA) guidelines mention delirium in the context of screening for psychiatric sequelae to stroke in end of life care [19]; Canadian guidelines were the most detailed, and contained a clear message about the importance of delirium as a complication in acute stroke. This was discussed in relation to screening for cognitive impairment or a change in cognitive function, and there is a clear call to screen patients at risk, using a validated screening tool [20].

Screening for delirium in other clinical settings is considered important across several countries: Clinical guidelines published in the UK [7], United States of America [21], Australia [22] and Canada [23] all guide clinicians to screen for delirium in services which are known to have a high prevalence of the condition. This is in order to ensure delirium is not missed or misdiagnosed, and thus to decreased length of hospital stay and unfavourable outcomes and ultimately generate cost savings for the organisation ((National Institute for Clinical Excellence 2010; (Canadian Coalition for Seniors' Mental Health 2006). As for the method of diagnosis, the UK and Canadian documents specifically recommend the use of the Confusion Assessment Method (CAM) [24] as the diagnostic tool of choice.

Taken together, it is clear that screening and diagnosis of delirium is important in a variety of settings, but there is no clear guidance about how, when and how often to screen patients for delirium after stroke. Although research studies of delirium in acute stroke describe how delirium is identified [4], it is unclear what happens in clinical practice, namely, how is delirium identified and diagnosed, and by whom. Literature from the general medical / geriatric settings give an indication that in practice, delirium is under-recognised, and staff do not routinely use screening tools in daily practice [25, 26].

The aims of this web-based survey were to investigate the use of delirium screening and diagnostic tools in patients with acute stroke. We sought to identify whether and if so, how doctors and nurses across Scotland screen for and diagnose delirium in acute stroke.

The survey explored the following questions:

- Is delirium screened for in routine clinical practice?
- How often does screening for delirium in acute stroke take place and what is the method of screening and or diagnosis in clinical practice?
- Who is most likely to identify delirium in acute stroke?
- Which delirium identification tools (if any) are used?
- What are clinicians' views about the suitability of screening tools as they are used within acute stroke care?

Methods

Survey Questionnaire

The Bristol Online Survey Tool was used to set up, collect and subsequently analyse the survey data. This tool is widely used by Universities and other public bodies in the UK [27]. Web surveys are inexpensive, they increase the ease of administration for the research team and allow data to be analysed as soon as it is logged on the online survey tool [28]. Web-based surveys yield the same findings as paper surveys in terms of content [29, 30] although online surveys may yield a slightly lower response rate [31]. We attempted to maximise response by keeping the length of the survey as short as possible, maintaining a clear structure and using clear language [31]. A scrolling design (rather than the questions set over several webpages) was chosen to maximise ease of use and minimise potential technical difficulties. This design is reputed to increase response rate as it reduces the time taken to complete the survey [32]. Survey questions were constructed based on published guidance on effective question writing [33] and effective design for web-based response options such as minimising "drop down boxes" as they are burdensome to respondents [34]. Following questionnaire development, the survey tool was distributed to three clinicians: a stroke physician, a stroke nurse specialist and a psychiatrist. This process was used to check for language, structure and sequence of the questions presented [35] but no data were collected during this process. Two minor difficulties related to ambiguity of questions were identified and rectified prior to the survey being distributed among stroke clinicians practising throughout Scotland.

Sample and Recruitment

The survey was distributed to 217 clinicians (doctors and nurses) working the acute stroke setting in Scotland by the administrators of the British Association of Stroke Physicians (BASP) and the Scottish Stroke Research Network (SSRN), and the first author contacted all (n=114) members of the Scottish Stroke Nurses Forum (SSNF) directly. The first author cross checked the complete distribution lists of SSRN and SSNF and removed duplicate names and email addresses. The BASP database was not shared with the first author therefore it was not possible to check for duplicates with other databases, we were informed by the administrator that the approximate number of BASP members in Scotland is 60. The initial invitations were sent by email in July 2012. Two further email reminders were sent two weeks apart, in August 2012. In order to be able

to calculate response rate as accurately as possible, respondents were asked not to disseminate the email invitation among their colleagues.

Data Analysis

Descriptive statistics were used to report nominal data. Free text comments were analysed by the first author using qualitative content analysis methodology: the first author read and re-read the words used in the responses and then classified into small sets of categories, or codes, of shared meaning. The codes were counted to determine how frequently they appear within the text responses and patterns relating to the key themes emerged [36-38]. Data regarding size of stroke unit and number of stroke beds of all hospitals across Scotland were obtained via Information Service Division Scotland [39] these are presented in table 1 to categorise respondent characteristics.

Ethics

This study did not require ethical approval as it an opinion survey seeking the views of NHS staff on service delivery. A letter of confirmation was obtained from the South East Scotland Research Ethics Service. Ethical approval was gained from Queen Margaret University.

Results

65 (30%) responses were received following an initial email and two reminders. A total of 36/90 (40%) of doctors replied, 29/127 (23%) of nurses replied. The characteristics of the respondents are summarised in table 1.

Screening for Delirium

In response to the question: *“does your ward have a policy on screening new patients for delirium?”* 21/65 (32%) respondents selected ‘yes’, 35 respondents (53.5%) replied ‘no’ and 9 respondents (14%) responded ‘unsure’. In response to the question *“do you routinely screen for delirium on admitting new patients to the ward”* 31(48%) selected “yes” and 34 (52%) selecting “no”. The following question: *“Do you screen patients for delirium on a regular basis during admission?”* yielded the same result, with 31 (48%) selecting “yes” and 34 (52%) selecting “no”. Of the 31 respondents who selected “yes”, 25 (81%) reported screening “as the need arises”; two (6.5%) selected “once weekly” and four (13%) selected “other” and provided a short text explanation: two respondents stated that screening occurred during ward rounds or if a concern is raised by a staff member. One person stated they screened daily and one respondent stated they screened on admission (which answers the original question *“do you routinely screen for delirium on admitting new patients to the ward?”*).

Diagnostic Methods

In response to the question: *“How do you normally diagnose delirium in stroke patients?”* 28 respondents (43%) reported applying their clinical judgement, two respondents (3%) reported using a standardised tool and the remaining respondents reported combining clinical judgement with the application of a standardised tool (n=21, 32.3%). Two respondents selected “other”, one reported using: *“amt (Abbreviated Mental Test) and urine testing, observations”* and the other reported using the CAM [24]

to diagnose delirium. Twelve respondents (18.5%), all of whom were nurses, stated that they do not diagnose delirium in their practice and selected the option *"I have not been trained to use a standardised tool"*. Table 2 summarises these results.

Clinicians' choice of diagnostic tool

Table 2 outlines the structure of the questions relating to the choice of diagnostic tool. Free text comments made in response to the question on clinicians' choice of diagnostic tool revealed that six (9%) respondents used a tool developed by a local collaboration between Liaison Psychiatry and Geriatrics known as "4AT" [40]. Four respondents reported using either the Abbreviated Mental Test (AMT)[41] or the Mini Mental State Examination (MMSE)[42].

Suitability of the diagnostic tool in a stroke population

Respondents were asked *"Do you think the tool you use is suitable for a stroke population?"*. A total of 52 (80%) of the 65 respondents answered this question. Seven respondents selected "yes" (13.5%), 16 respondent selected "no" (31%) and the remaining 29 selected "not sure" (56%). Figure 1 cross references those who selected their tool of choice with clinicians' opinion regarding suitability for stroke patients. 15 (23%) participants gave free text comments: The majority (n=8; 53%) of comments related to the difficulty using a generic screening tool with persons who experience communication difficulties such as receptive or expressive dysphasia. Four respondents questioned the validity of the tool in a stroke population and discussed in particular cognitive or *"neurological abnormalities"* arising from the stroke. One respondent felt the tool they used had *"reasonable face validity"* and one further respondent advocated the use of the CAM [24].

Discussion

Our survey results highlight a number of key findings that reveal current delirium diagnostic and screening practice in Scottish stroke services. Most stroke units either did not have a screening policy for the identification of delirium in acute stroke, or the clinicians were unaware of such policy. Almost half of respondents to this survey stated that they did not routinely screen for delirium in acute stroke. The diagnosis of delirium was reportedly made mainly by doctors, in most cases by means of clinical judgement, in some cases combined with the use of a standardised tool. Interestingly, the majority (41%) of nurses who responded to this survey (n=12) claimed that they do not diagnose delirium in their practice, citing lack of training to use a standardised tool as the main reason for this. This finding supports the findings of a survey of nurses across intensive care and general medical / surgical units which highlights that nurses have only modest confidence levels in identifying delirium in clinical practice [43]. Other authors have reported infrequent use of standardised tools for the screening and/or diagnosis of delirium: nurses reportedly rely largely on clinical judgement when it comes to diagnosing delirium. In these studies, the clinicians surveyed recognised the importance of delirium as an underdiagnosed condition of potentially serious consequences, however, routine screening and utilisation of standardised observation tools was still the exception in a variety studies [43-45]. Surveys of doctors highlight similar concerns: a survey of

Brazilian critical care physicians found that less than 15% of respondents used validated delirium assessment tools [46]. An American survey of ICU clinicians found that despite the belief that the literature supported routine screening for delirium, only 40% of respondents did so, and of those, only a small number used specific delirium screening tools [47]. Furthermore, a finding from a survey of junior doctors working in a variety of medical settings in the UK revealed that the fundamental cause of under-recognition and under treatment of delirium lies in the lack of knowledge of the diagnostic criteria and standardised screening tools [48].

Within our own survey, a small number of respondents reported using a variety of tools to diagnose delirium in their practice, citing tools which have not been validated for the use in acute stroke [40, 42]. Some studies found a degree of usefulness in detecting cognitive changes using the AMT [41] and the MMSE [42] which might be due to delirium [49-51], however these tools are not specifically designed to detect delirium [47, 52, 53]. Some of our respondents reported difficulties in using diagnostic tools in stroke patients because of aphasia. Our systematic review highlights that previous studies have excluded patients with aphasia from their cohorts for the same reason [4]. In our survey, only two respondents reported using the CAM-ICU, which might increase the proportion of patients with language difficulties who may be assessable [54] as the CAM-ICU does not rely on language for the diagnosis of delirium [47, 55]. This tool has recently been validated for use in stroke patients, demonstrating high sensitivity, specificity, overall accuracy and inter-rater reliability [14, 56]. Various authors, in both nursing and medical literature are calling for clinicians to take a key role in the identification of delirium in practice, advocating the use of validated instruments to facilitate accurate and timely recognition, leading to prompt treatment and better outcomes for patients [5, 14, 25, 57].

Our response rate was 30%, a rate lower than a number of surveys (both online and traditional) of delirium identification published within the last five years [44-46, 48]. Our response rate seems to be influenced by the notable difference between doctors and nurses response to our invitation to participate: only 23% of nurses approached actually completed the survey. Eley et al. [58] identified the main barrier to nurses' access to computers in the ward environment as lack of time due to other demands of the job. This may be a reason why the response rate from the nurses in this survey was comparatively low.

Strengths, Limitations and Future Research

We were keen to explore practice within Scotland only at this stage, and we would plan to roll out the same survey throughout the UK. Our response rate was moderate but consistent with the literature on online surveys return rates [31, 59]. Other surveys examining delirium identification utilised a variety of methods of survey distribution which yielded better response rates, e.g. using a combined approach of both paper and online options [45] or using the traditional postal questionnaire design [44, 48]. We were keen to be able to calculate our response rate, therefore we used convenience sampling and approached specific individuals in the clinical field and avoided snowballing, but this may have introduced a selection bias. Nevertheless, our data are of interest because this is, to the best of our knowledge, the first survey of diagnostic and screening practice in

relation to delirium in acute stroke services in the UK. Our survey contributes to a growing body of knowledge on delirium in acute stroke. This field of research is steadily growing as more publications are generated on the various aspects of identification [14, 50] and potential treatment [60, 61] of the condition.

It was interesting to note the inconsistent screening and diagnostic practice identified by this survey, which is perhaps related to the lack of guidance or policy regarding screening and diagnosis of delirium in stroke. It would be beneficial for UK best practice guidelines in stroke care [15, 17] to incorporate information on delirium and perhaps consider establishing a standardised way of identifying the condition in this population. This would require further research to be conducted, not only into validating a tool to detect delirium in stroke patients, but also to establish the most effective time intervals for screening patients. Another avenue for further research is to identify the barriers to regular, effective screening for delirium across all members of the multidisciplinary team. In light of the fact that both this survey and others have identified the need for training and increasing awareness of delirium among staff working with stroke patients, we would like to reiterate the importance of this and call for more staff to become familiar with the risk factors and outcomes associated with delirium. Increasing the amount of correctly identified cases of delirium may lead to better outcomes for these patients and may yield cost benefits to the organisation [7].

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Figure 1: Is the tool you use suitable for use in stroke patients?

CAM: Confusion Assessment Method

CAM-ICU: Confusion Assessment Method for Intensive Care Unit

4-AT: The 4 A test [40]

Table 1: Respondent characteristics

	n=65 (%)	
Profession		
Doctors	36 (53.7)	
Nurses	29 (43.3)	
Grade		
Consultant	24 (36.9)	
Senior Trainees (doctors)	12 (18.4)	
Senior nurse (band 7 and above)	14 (21.5)	
Main grade nurse (band 6 and below)	15 (23.0)	
Main practice area		
Specialist stroke unit	47 (72.3)	
General hospital ward	8 (12.3)	
Both of the above	10 (15.4)	
N patients admitted to respondents' workplace each year[39]:		
>500	15 (23)	
250-500	39 (60)	
100-250	7 (10.7)	
<100	4 (6.1)	

Table 2: Questions regarding diagnostic practices and tools utilised.

Question	Doctors n=36	Nurses n=29
How do you normally diagnose delirium in stroke patients?		
Standardised tool	1 (2.7%)	1 (3.4%)
Clinical judgement	22 (61%)	6 (20.6%)
Both the above	13 (36.1%)	8 (27.5%)
I do not diagnose delirium in my practice	0	12 (41.3%)
Other	0	2 (6.8%)
If you use a tool to diagnose or screen for delirium in stroke patients please indicate which tool you use:		
CAM	11 (30%)	7 (24.1%)
CAM-ICU	2 (5.5%)	0
DRS	0	0
Delirium Symptom Review	1 (2.7%)	0
Organic Brain Syndrome Scale	0	0
Other	8 (22.2%)	4 (13.7%)
No response	14 (38.8%)	18 (62%)

CAM=Confusion Assessment Method

CAM-ICU=Confusion Assessment Method for Intensive Care Unit

DRS= Delirium Rating Scale

Number of clinicians who reported using the test

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